

Test of Advanced Fine Water Mist Nozzles in a Representative Spacecraft Atmosphere, Phase I

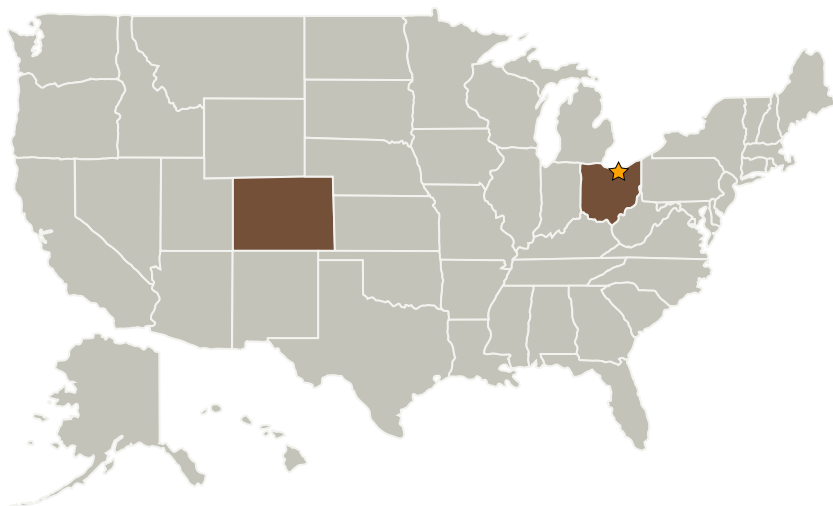
Completed Technology Project (2009 - 2009)



Project Introduction

Fine water mist is being considered as a replacement technology for fire suppression on the next generation of manned spacecraft. It offers advantages in performance, ease of cleanup, compatibility with on-board environmental systems, and ability to recharge during a mission. ADA Technologies has designed a prototype hand-held extinguisher that is being tested at ambient environmental conditions. In this SBIR program ADA Technologies proposes to advance this prototype with a new design for a reduced-momentum nozzle to generate a fine water mist that can be discharged into confined and obstructed spaces to attack hidden fires as well as open fires in manned spacecraft. In Phase I multiple nozzle concepts will be designed, fabricated, and competed to identify the most promising concepts. In addition, we will adapt a vacuum chamber at team member Colorado School of Mines to evaluate the advanced nozzles against fires in an atmosphere of 34% oxygen and 7.6 psia total pressure, representative of the conditions in manned spacecraft. These tests will validate the efficacy of Fine Water Mist at these nonstandard atmospheric conditions. Phase I products will include a comprehensive specification for a beta prototype hand-held FWM extinguisher that incorporates the best advanced reduced momentum nozzle. In Phase II we will carry the beta prototype design forward to testing in microgravity and develop a plan for flight qualification of the hardware. We will work with a partner experienced in the production and qualification of flight test fixtures and experiments. ADA will partner with a commercial supplier of fire protection equipment to take this technology into the broader commercial marketplace, targeting aerospace and flammable fuels storage as early market segments.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Glenn Research Center (GRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★ Glenn Research Center(GRC)	Lead Organization	NASA Center	Cleveland, Ohio
ADA Technologies, Inc.	Supporting Organization	Industry	Littleton, Colorado

Primary U.S. Work Locations

Colorado	Ohio
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Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
 - └ TX06.4 Environmental Monitoring, Safety, and Emergency Response
 - └ TX06.4.2 Fire: Detection, Suppression, and Recovery